Institute for Empirical Research in Economics
University of Zurich

Working Paper Series
ISSN 1424-0459

Working Paper No. 257

Protecting Cultural Monuments Against Terrorism

Bruno S. Frey and Dominic Rohner

November 2005

Protecting Cultural Monuments Against Terrorism

Bruno S. Frey[◊] Dominic Rohner[°]

(University of Zurich) (University of Cambridge)

22 November 2005

Abstract: Famous cultural monuments are often regarded as unique icons, making them an attractive target for terrorists. Despite huge military and police outlays, terrorist attacks on important monuments can hardly be avoided. We argue that an effective strategy for discouraging terrorist attacks on iconic monuments is for the government to show a firm commitment to swift reconstruction. Using a simple game-theoretic model, we demonstrate how a credible claim to rebuild any cultural monuments destroyed discourages terrorist attacks by altering the terrorists' expectations and by increasing the government's reputation costs if they fail to rebuild.

Keywords: Terrorism, Culture, Monuments, Counter-terrorism, Deterrence.

JEL-Classification: D74, H56, Z10.

[◊] Corresponding author: Institute for Empirical Research in Economics, Bluemlisalpstrasse 10, 8006 Zurich, Switzerland. E-mail: bsfrey@iew.unizh.ch.
[°] Faculty of Economics, Sidgwick Avenue, Cambridge CB3 9DD, United Kingdom. E-mail: dr296@cam.ac.uk.

Protecting Cultural Monuments Against Terrorism

I. Terrorism and Cultural Monuments

"Cultural Monuments" are understood here to be the most important buildings representing a nation's cultural identity. They are sometimes monuments of great historical importance (as e.g. St. Peter's Basilica in Rome), but often they are "icons" with which the whole nation identifies itself (such as the Americans with the Statue of Liberty in New York). Cultural monuments are universally famous and therefore an attractive target for terrorists. It is well known (see Hoffman 1989, Crelinsten 1990, Wilkinson 2000, Frey 2004) that a major goal of terrorists is to gain media attention. Indeed, one can speak of a symbiotic relationship: terrorists depend on the media, and the media profit from reporting terrorist attacks (Frey and Luechinger 2003, Frey and Rohner 2005). If, for instance, the "Eiffel Tower" in Paris was to be blown up in a terrorist attack, this would generate a huge amount of media attention, therewith publicizing the respective terrorists' goals.

Governments are, of course, aware of this danger and seek to protect their cultural monuments. They take defensive measures, either by closing the sites completely, or severely restricting access, causing considerable utility losses to prospective visitors. Such precautions also cause high direct costs in terms of manpower and material. Nevertheless, experts are well aware that terrorist attacks are an ever-present threat. Thus, for example, Palac-McMiken (2005) shows for the transport sector that countering the terrorist risk is extremely costly and that it is impossible to remove the risk of terror attacks completely. When discussing terrorism, the ECONOMIST (8th October 2005, p. 12) accordingly entitles its article: "The

bomber will always get through". This makes it clear that "where there's a will, there's a way". No matter what precautionary measures are taken, some cultural monuments will remain subject to terrorist attacks and thus liable to being completely or partially destroyed in the future.

We suggest that, in many cases, an attractive – if somewhat unorthodox – strategy is to reduce defensive protection measures to a minimum, but *to be fully prepared for the eventuality and build a rapid and identical reconstruction* once an (unavoidable) terrorist attack has occurred. Modern technology allows us to rebuild a monument (almost) identical to the original and to restore it to its former glory. Well-known examples are the Frauenkirche in Dresden or the Chapel Bridge in Lucerne. This strategy reduces major direct and indirect utility losses due to protective measures. Most importantly, terrorists are rational enough to comprehend that the cultural monument will be rapidly restored, which the media will claim as a victory over terrorism. The terrorists therefore have less incentive to undertake the attack in the first place.

Section II models the presumed interaction between terrorists and the government and section III presents some evidence about the possibilities and costs of reconstructing a cultural monument. Section IV concludes.

II. Model of the Interaction Between the Terrorists and the Government

The *a posteriori* decision of the government whether or not to rebuild a national icon in case it gets destroyed influences the *a priori* decision of the terrorists whether or not to attack a particular national icon. If terrorists expect the national monument to be rebuilt, they are less likely to attack it in the first place, as they would like to make a long-lasting symbolic impact. Thus, expectations are of crucial importance for the present issue. An important question to

ask is: Can the terrorists' expectations be influenced in such a way as to lower the risk of them being motivated to carry out a terrorist attack?

The fundamental features of the question posed are similar to some models of financial crisis. In particular, the model of Obstfeld (1986) is relevant. The main focus is on expectations, self-fulfilling prophecies and policy recommendations.

Equation (1) displays the loss function of the government of a given country.

$$(1)\quad L = \alpha r - \beta E(r) + c$$

where α =parameter, r=relative cost of reconstruction (if alternative policies are taken into account), β =parameter, E(r)=expected value of r, c=reputation cost of not rebuilding the national monument after it has been destroyed.

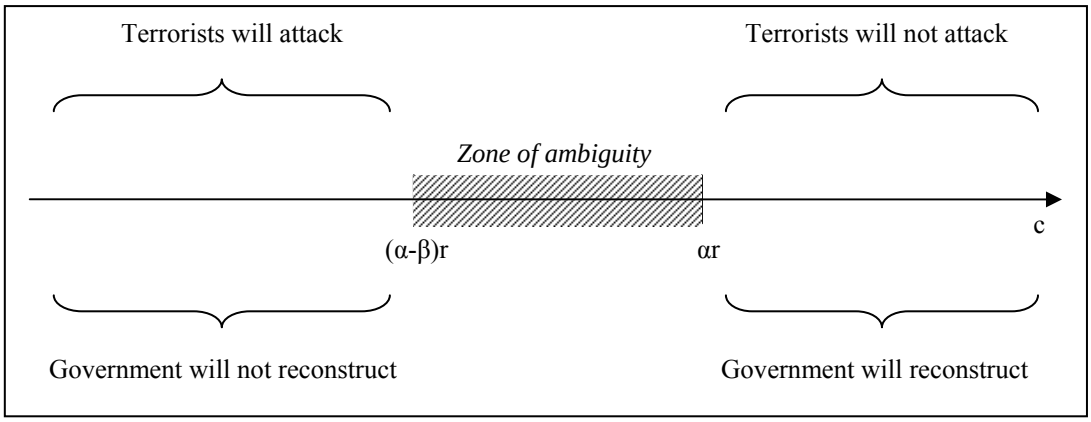
The term E(r) corresponds to the expectations of the public, which includes investors, lobbies and potential terrorists. If the public thinks that the state will rebuild the icon destroyed, E(r)=r, whereas if reconstruction is not anticipated, E(r)=0. The expression $\beta E(r)$ has a negative sign, as it is cheaper in the long run to rebuild a national monument if the public believes that the state is determined to carry out the reconstruction. Lobbies may advocate another use for the area of land where the monument once stood if the government does not seem absolutely determined to rebuild the icon, and investors may hesitate to invest money in a project if they are not convinced that it will indeed be completed.

The reputation cost of not rebuilding is c. It represents the cost of the prestige loss due to the icon being destroyed and the reputation cost of being perceived as a "lame duck" government.

As shown in figure 1, when reconstruction is very costly and when the reputation cost of not rebuilding is very low, i.e. when $c < (\alpha - \beta)r$, the government will never rebuild and the

terrorists will always attack. By contrast, when reconstruction is relatively inexpensive, and when the credibility cost of not rebuilding is high, i.e. when $c > \alpha r$, the government will always rebuild the icon and the terrorists will never attack.

Figure 1: Government action and terrorist action for different values of c



There is a zone of ambiguity in between those two clear-cut cases where expectations are important. Both the government and the terrorists are assumed to undertake Bayesian updating. They know both their own expectations and those of the opponent, and assume that the opponent is consistent and correct in his beliefs. In this ambiguity zone, expectations are self-fulfilling and multiple equilibria emerge.

If the terrorists and the rest of the public expect that the government will not rebuild the national icon after an attack, $\beta E(r) = 0$. In the case of $c < \alpha r$, the terrorists will attack because they expect that the government will not rebuild the monument. In the case of $c > \alpha r$, the terrorists will not attack because they expect that the government will rebuild the monument.

By contrast, if the terrorists and the rest of the public believe that the government will rebuild the monument after an attack, $\beta E(r) = \beta r$. This results in the terrorists attacking because they believe the government will not rebuild the monument in the case of $c < (\alpha - \beta)r$,

and in the terrorists not attacking because they believe the government will rebuild the cultural monument in the case of $c > (\alpha - \beta)r$.

To summarize, in the zone of ambiguity, terrorists attack if the government does not seem determined to rebuild the monument, and terrorists do not attack if the government is able to convince them and the public of its determination to rebuild the monument in case of an attack.

Thus, by showing strong determination and commitment, the government can avoid terrorist attacks in the zone of ambiguity, and can at the same time increase the credibility cost of not rebuilding c, which also deters terrorists from attacking.

Measures of showing more commitment include public announcements, drawing up reconstruction plans or putting the necessary amount of money on a blocked bank account.

III. Evidence About the Possibilities and the Costs of Reconstruction

This paper argues that a cost-effective way of diminishing the risk of cultural monuments being destroyed is for the government to be totally committed to rebuilding them in case of a terrorist attack. However, to discourage an attack, this commitment to reconstruction has to be credible. Reconstruction has to be technically and financially feasible.

There do not seem to be any empirical estimates for the costs of protecting a cultural monument from terrorist attacks and of reconstructing such a monument after the terrorists have struck. Obviously, the relative costs vary considerably according to what kind of monument we are dealing with and the extent to which it has been damaged by a successful terrorist attack. Total destruction seems to be an unlikely scenario; in most cases, a monument is only partially destroyed. This has, for instance, been the case even after prolonged bombardments from airplanes. Thus, the Frauenkirche in Dresden, which was subject to

heavy bombing by the Royal Air Force in February 1945, and which collapsed two days later, was not totally destroyed. In the reconstruction, completed in October 2005, parts of the walls still standing were reintegrated, as well as part of the building materials still on the site.

The Frauenkirche in Dresden provides a good example of a successful and economically feasible reconstruction of an icon. The rebuilding of this church began in 1994, almost 50 years after it was destroyed. The reconstruction cost amounts to about $130 million. Modern technology enabled this "unique" monument to be rebuilt so that it closely resembled its original state. The restored baroque altar, for example, was assembled using more than 2000 pieces of debris.

More than half of the reconstruction costs were financed by charity donations from all over the world. Taking future benefits from tourism into account, this reconstruction is also justifiable from an economic point of view.

Other examples of successful reconstructions include the famous wooden bridge of Lucerne after it was destroyed by fire, or the complete reconstruction of the old part of Warsaw.

A recent report from the UNESCO (2004) calculates the costs of reconstruction or renovation for 28 different cultural monuments in Kosovo, which were partially or totally destroyed by the armed conflict. These monuments include churches, monasteries and historical buildings. On average, the funds needed for a complete reconstruction or renovation amounted to about $830'000 per monument. The costs of reconstruction thus appear to be quite low.

No general estimates are available for the costs of partially or totally rebuilding a monument. Reconstruction seems to be a relatively cheap option compared to high level security measures and restrictions. A RAND study by Zycher (2003) considers, for instance, the direct monetary costs of counterterrorism in the United States. He documents that US federal spending increased by $95 billion in the aftermath of the terrorist attacks of 9/11, a

substantial part of which was used for deterrence measures involving police and military outlays. Zycher also computes long-run expenditures for counter-terrorism according to different scenarios. For the "moderate case", counter-terrorism expenditures are expected to amount to $10 billion per year, whereas for the "severe case" and the "nuclear case", they would be respectively about $200 billion or $300 billion per year.

It is not feasible to provide any general estimates of the benefit-cost ratios of either protecting an iconic monument against terrorist attacks or of preparing for a rapid rebuilding in case it is attacked and damaged. Accordingly, neither of the two policies can be considered superior in any general way. Rather than siding with one policy or the other, this paper proposes reconstruction as a *possibility,* which the literature so far has rarely, if ever, considered as an alternative to anti-terror policy.

While no general evaluation of the benefit-cost ratio of the two policies is possible, the major cost components can nevertheless be identified. Depending on the particular cost situation, or relative prices in a given country (e.g. the labor costs are higher in a rich economy than in a poor economy), the balance of economic advantage is tilted in favor of one or the other policy.

As has been pointed out, the *protection* policy is not able to ensure that an iconic monument will never be attacked. What it can achieve is a smaller or greater reduction in the probability of attack. The probability of attack may vary enormously from one monument to another. Some monuments can quite effectively be protected by structures prohibiting cars loaded with explosives coming anywhere near the building; in other cases, a small number of guards can achieve the same effect. In many cases, however, it takes a substantial number of guards protecting a monument day and night to significantly reduce the probability of attack and prevent serious damage. In view of the high labor costs, such protection is expensive in highly developed economies.

A major cost of the *reconstruction* policy lies in making elaborate plans for rebuilding. A high level of expertise is necessary in these areas. The corresponding costs are lower in developed economies with more sophisticated planning and building technology than in less developed economies. In any event, it is reasonable to undertake *some* degree of protection, but the level of protection could be considerably lower.

With these considerations in mind for rebuilding a *similar* iconic monument, poorer countries might find it advantageous to lean more towards a protective policy, while richer countries might lean more towards a policy of reconstruction. This does not necessarily mean that richer countries will find that the optimal solution is to rely mainly on reconstruction; the iconic monuments may be of a nature which makes it very expensive to rebuild, for instance because it requires high labor input to achieve. Conversely, poorer countries may well rely on the rebuilding strategy in the case of monuments where it is relatively inexpensive and easy to carry out.

The benefit-cost ratios used to compare the two policies should not be confined to material and labor costs. The two policies also entail differences in the extent to which access to the sites is made more difficult. This causes a loss due to the reduced exposure to a "national icon". An extreme example is when a monument no longer serves the purpose for which it was built. Another cost to be taken into consideration is the possible loss of human rights produced by an anti-terrorist policy (see for example Mueller 2004, Roth 2004, Foot 2005, Gearty 2005). Taking both types of costs into consideration, the *reconstruction* policy seems to have a definite advantage.

IV. Conclusion

The present contribution deals with the protection of cultural monuments ("icons") against terrorist attacks. Using a simple game-theoretic model, it is shown that, by committing

themselves to the reconstruction of icons which are destroyed, the government reduces the terrorist threat. Measures of commitment such as public announcements, the availability of detailed reconstruction plans, and the creation of blocked bank accounts alter the terrorists' expectations and raise the loss of reputation if the government reneges from its commitment. As a result, terrorists are discouraged from attacking. Determination to rebuild the monument in case of a terrorist attack has the consequence that reconstruction is often no longer necessary.

Preliminary evidence suggests that the reconstruction of attacked icons is, in many cases, less costly than expenditures for deterrence which, moreover, will never be able to provide complete protection against terrorist attacks. Reconstruction appears to be a technically and economically attractive policy option, which should be taken into consideration as a part of anti-terrorist policy.

References

Crelinsten, Ronald (1990). Terrorism and the Media: Problems, Solutions and Counterproblems. In David Charters (ed), *Democratic Response to International Terrorism*. Ardsley-on-Hudson, New York: Transatlantic Publishers: 267-307.

Foot, Rosemary (2005). Collateral Damage: Human Rights Consequences of Counterterrorist Action in the Asia-Pacific. *International Affairs,* 81: 411-25.

Frey, Bruno (2004). *Dealing with Terrorism – Stick or Carrot?* Cheltenham UK: Edward Elgar Publishing.

Frey, Bruno and Simon Luechinger (2003). How to Fight Terrorism: Alternatives to Deterrence. *Defence and Peace Economics,* 14: 237-49.

Frey, Bruno and Dominic Rohner (2005). Blood and Ink: The Common-Interest-Game Between Terrorists and the Media, unpublished manuscript.

Gearty, Conor (2005). 11 September 2001, Counter-Terrorism, and the Human Rights Act. *Journal of Law and Society,* 32: 18-33.

Hoffman, Bruce (1998). *Inside Terrorism*. New York, Columbia University Press.

Mueller, Dennis (2004). Rights and Citizenship in a World of Global Terrorism. *European Journal of Political Economy,* 20: 335-48.

Obstfeld, Maurice (1986). Rational and Self-Fulfilling Balance of Payments Crisis. *American Economic Review,* 76: 72-81.

Palac-McMiken, Evanor (2005). Economic Costs and Benefits of Combating Terrorism in the Transport Sector. *Asian Pacific Economic Literature,* 19: 60-71.

Roth, Kenneth (2004). The Law of War in the War on Terror. *Foreign Affairs,* 83: 2-7.

Unesco (2004). Cultural Heritage in South-East Europe: Kosovo. Cultural Heritage in South-East Europe Series Nr. 2, Venezia, Unesco.

Wilkinson, Paul (2000). *Terrorism Versus Democracy: The Liberal State Response*. London: Frank Cass.

Zycher, Benjamin (2003). *A Preliminary Benefit/Cost Framework for Counterrorism Public Expenditures.* Santa Monica: Rand.